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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/770,699	01/26/2001	F. Daniel Gealy	98093DIV	7854

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EXAMINER

TRINH, MICHAEL MANH

ART UNIT	PAPER NUMBER
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2822

DATE MAILED: 07/17/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/770,699

Applicant(s)

GEALY ET AL.

Examiner

Michael M Trinh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 May 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 38-80 is/are pending in the application.
- 4a) Of the above claim(s) 44,50 and 61-80 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 38-43 and 45-49, 51-60 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

*** This office action is in response to Applicant's election filed on May 20, 2002. Claims 1-37 were canceled. Claims 38-80 are currently pending, of which claims 44,50,61-80 are withdrawn from consideration.

*** Applicant is advised that by incorporating all limitations of base claim 38, amended claim 51 is identically duplicated that of claim 52. One of the claims 51 or 52 should be amended or cancelled to avoid the duplication.

(Also noted that by incorporating all limitations of base claim 38, non-elected claim 44 is identically duplicated to that of claim 64).

Election/Restrictions

1. Claims 44,61-80 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election filed on May 20, 2002 was made without traverse as treated in Paper No. 7.

Claim Objections

2. Claims 52 and 57 are objected for having the following grammatical errors

*** In claim 52, line 4, the phrase "forming the first electrode" should be --forming a first electrode...--. The phrase "...first electrode...polysilicon selected...metals..." is confusing, and should be --...first electrode...polysilicon, wherein the first electrode is selected...".

*** In claim 57, "a first electrode" should be --the first electrode--.
Correction is respectfully required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. Claims 38-39,41-43,45-49 are rejected under 35 U.S.C. 102(b) as being anticipated by Fazan (5,478,772).

Fazan teaches a method for forming a capacitor comprising at least the steps of: forming a first electrode 85 (Fig 11A,9B; col 4, line 60 through col 5, line 7) selected from a group consisting of transition metal or a conductive metal oxide; forming a dielectric 90 (col 5, lines 27-44) on the first electrode; and forming a second electrode 95 (col 5, lines 20-26) on the dielectric, wherein the dielectric is formed between the first and second electrodes (Fig 11A; col 5, line), wherein the metal includes platinum formed by CVD, wherein the metal oxide includes RuO_2 , wherein $x = 2$, wherein the second electrode includes CVD of Platinum, TiN, wherein the dielectric includes barium strontium titanate (BST), SrTiO_3 , $\text{Ba}_x\text{Sr}_{1-x}\text{TiO}_3$.

5. Claims 38-43,45-49,51,52-60 are rejected under 35 U.S.C. 102(e) as being anticipated by Fukuzumi et al (6,222,722).

Fukuzumi et al teaches a method for forming a capacitor comprising at least the steps of: forming on a substrate assembly a layer of hemispherical grain polysilicon (12 in Fig 11; col 9, line 45 through col 10; 51 in Figs 30-34; col 14, line 45 through col 15); forming a planarization first electrode of a CVD metal (13 in Fig 12; col 7, lines 40-60; or 52 in Figs 30-34) on the polysilicon selected from a group consisting of transition metal or a conductive metal oxide; forming a dielectric 14,53 on the first electrode; and forming a second electrode (15 in Fig 13; 54 in Fig 33) on the dielectric, wherein the dielectric is formed between the first and second electrodes, wherein the first electrode 13,52 of metal including ruthenium, platinum, Ir, Rh and its metal oxide including RuO_2 , wherein $x = 2$ (col 14, line 66 through col 15, line 10; col 9, lines 49-67; col 16, line 62 through col 7; col 20, lines 10-25), wherein the second electrode 15,54 including ruthenium, platinum, wherein material for forming the electrode including ruthenium, platinum, oxide thereof, or W, WN, Al, Ti, TaN (col 17, lines 12-18), wherein the

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dielectric 14,53 includes barium strontium titanate (BSTO), Ta_2O_5 , $SrTiO_3$, $BaSrTiO_3$ (col; 17, lines 3-10), wherein removing the hemispherical grain polysilicon 23,4 is shown in Figs 22-23, 4-5, wherein the substrate assembly comprising an interconnect 3 recessed in the substrate (Figs 1-5,21-24,33,38), wherein the substrate assembly comprising a contact (Figs 21-24,33,38), wherein the first electrode formed in the contact and the interconnect recessed in the substrate.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 40,41-43,45,48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fazan (5,478,772) and/or Fukuzumi et al (6,222,722).

Fazan teaches a method for forming a capacitor as applied above to claims 38-39, 41-43,45-49, and fully repeated herein. Fukuzumi et al teaches a method for forming a capacitor as applied above to claims 38-43,45-49,52-57, wherein the first electrode 13,52 of metal including ruthenium, platinum, Ir, Rh and its metal oxide including RuO_x , wherein $x = 2$ (col 14, line 66 through col 15, line 10; col 9, lines 49-67; col 16, line 62 through col 7; col 20, lines 10-25), wherein the second electrode 15,54 including ruthenium, platinum, wherein material for forming the electrode including ruthenium, platinum, oxide thereof, or W, WN, Al,

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Ti, TaN (col 17, lines 12-18), wherein the dielectric 14,53 includes barium strontium titanate (BSTO), Ta₂O₅, SrTiO₃, BaSrTiO₃ (col; 17, lines 3-10).

Re claims 41-43,45,48, Fazan and Fukuzumi et al thus disclose many, but not all, alternative materials for forming the electrode or dielectric as recited in claims 41-43,45,48.

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the electrode or the dielectric of Fukuzumi or Fazan by using other alternative materials as well known in the semiconductor art and as combinatively taught by Fukuzumi and Fazan, because substitution of art recognized equivalent materials would have been obvious and within the level of ordinary skill in the semiconductor art. Re claim 40, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the capacitor of Fazan in the opening by planarization after CVD forming the first electrode as taught by Fukuzumi (Fig 4; col 7, lines 40-59) because of the desirability to isolate a plurality of lower electrodes one from each other, and to form stacked container capacitor having high capacitance.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael M. Trinh whose telephone number is (703) 308-2554. The examiner can normally be reached on M-F from 8:30 Am to 4:30 Pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Whitehead Jr Carl can be reached on (703) 308-4940. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Oacs



Michael Trinh
Primary Examiner